

REMARKS

Claims 1-11, 13 and 15 are pending in this application. By this Amendment, claims 12 and 14 are canceled without prejudice to or disclaimer of the subject matter recited therein. The specification, drawings and claims 1, 7, 8, 13 and 15 are amended. No new matter is added.

I. Allowable Subject Matter

Applicant appreciates the indication of allowable subject matter in claims 7-15, they being allowable if rewritten in independent form to include all of the features of the base claim and any intervening claims. Claims 7-11, 13 and 15, as well as the remaining pending claims are in condition for the reasons discussed below.

II. Objection to the Specification

The specification is objected to for an informality at page 5, line 25. As the specification is amended in response to the objection, withdrawal of the objection to the specification is requested.

The specification is further amended to include subject headings to better comport with U.S. patent practice. Additionally, page 6, line 22 is amended to insert reference number "45" in place of reference number "50" identifying the stress raising feature shown in Fig. 4. The figure is amended to reflect the change. The change was made due to the duplicate recitation of reference number "50" describing the first ring shown in Fig. 5.

Page 7, line 12 of the specification was amended to remove reference number "56" as such a reference number is not shown in any of the figures.

III. Drawings

Fig. 4 is amended to replace reference number 50 as representing the "stress raising feature" with reference number "45", as reference number 50 is used in Fig. 5 to describe the first ring.

IV. Objection to the Claims

Claim 1 is objected to for an informality. As claim 1 is amended responsive to the objection, withdrawal of the objection is respectfully requested.

V. Claim Rejections Under 35 U.S.C. §112

Claims 1-15 are rejected under 35 U.S.C. §112, first paragraph. As claims 12 and 14 are canceled, the rejection of those claims is moot. Rejection of claims 1-11, 13 and 15 is respectfully traversed.

The Office Action alleges that it is not clear to what components in Fig. 3 rings 40 and 44 are connected, and to what component the first ring 50 in Fig. 5 is connected.

The claims are directed to a frangible coupling for the purpose of supporting a rotatable load having a first ring, a second ring, a plurality of ligaments and a load magnification member. The first and second rings are interconnected by the plurality of ligaments with the load magnification member provided on the first ring or rotatable load, there being a small clearance maintained between the members and ligaments adjacent thereto, such that, in use, when a load of a predetermined value causes the first and second rings to move relative to one another by a predetermined amount, thereby bringing at least one ligament into contact with the load magnification member, at least one ligament is caused to fit.

The subject matter recited in the rejected claims is sufficiently described in the specification to enable one skilled in the art to make and/or use the invention. For example, beginning at page 6, line 14, the specification recites that the frangible coupling 12 (shown in Figs. 1-3 in the overall structure and Figs. 4-6 in detail in various embodiments) comprises a first ring 40 axially joined via a row of generally circular cross-section fuse ligaments 42 to a second ring 44. Thus, the specification and claims clearly indicate that the first and second rings are part of the frangible coupling 12. Beginning at page 6, line 9, the specification

recites that the bearing 32 is supported by the non-rotatable frangible coupling 12 via a first static member 36 and that the coupling 12 is in communication with a non-rotatable section of the inner wall 24 via a second static member 38. Thus, it is clear from the claims and the specification that the rings 40 and 44 are part of the frangible coupling 12 which is connected to the first static member 36 which in turn is connected to the shaft 28 through the bearing 32, and connected to a second static member 38 which in turn is connected to the inner wall 24 as clearly shown in Fig. 3.

As described on page 7 beginning at line 10 of the specification, Fig. 5 presents an alternative embodiment of the frangible coupling 12. The coupling 12 comprises a first ring 50 and a second ring 54. The first ring 50 is fitted with a bearing that rotatably supports the first ring 50 and the shaft 60. Thus, there is ample description in the specification for what component the first ring 50 shown in Fig. 5 is connected to. Accordingly, withdrawal of the rejection to claims 1-15 under 35 U.S.C. §112, first paragraph is respectfully requested.

VI. Claim Rejections Under 35 U.S.C. §102

Claims 1-6 are rejected under 35 U.S.C. §102(b) as anticipated by any of U.S. Patent No. 3,659,877 to Kubasta, U.S. Patent No. 6,068,452 to Okada et al. (Okada) and EP 1 199441 to General Electric Co. (EP 441). The rejections are respectfully traversed.

None of the references disclose each and every feature recited in the rejected claims. For example, none of the references disclose a frangible coupling for the purpose of supporting a rotatable load having a first ring, a second ring, a plurality of ligaments and a load magnification member, the first ring and second ring interconnected by the plurality of ligaments, with the load magnification member provided on the first ring or rotatable load, there being a small clearance maintained between the members and ligaments adjacent thereto, configured such that, in use, when a load of a predetermined value causes the first and second ring to move relative to one another by a predetermined amount, thereby bringing

at least one ligament into contact with the load magnification member, at least one ligament is caused to fail, as recited in amended claim 1.

Support for the load magnification member recited in the amended claim may be found throughout the specification and at least at page 4, lines 4-9; page 6, line 17 - page 7, line 9; and page 7, line 10 - page 8, line 2.

Kubasta discloses a breakaway pipeline coupling which is adapted to separate and fall off the pipe when undue stress is placed thereon (col. 1, lines 5-8). The breakaway pipe coupling includes an upper flange 30 which encircles the upper pipe coupling 12. The upper flange 30 is secured to the pipe by welding (col. 2, lines 55-65). A lower split flange portion 35 includes half rings 46, 47 (col. 2, lines 66-75 and col. 3, lines 70 and 71). The upper flange member 30 and the lower split flange portion 35 are secured together by extending bolts 41 through apertures 32 and 39 (col. 3, lines 5-8). The bolts preferably include a central reduced portion which is adapted to part (break) when undue stress is put thereon (col. 3, lines 17 and 18). Should undue stress be placed on section pipeline 13, such stress will be transmitted to the coupling 10. In order to prevent damage to other, and possibly more expensive, equipment associated with pipeline sections 13 and 15, the bolts 41 part at their reduced portions 45 and the half rings 46 and 47 of the lower split flange portion separate. The lower flange portion 35, is no longer attached to the upper flange portion 30 and drops off the lower coupling member 12 (col. 3, lines 64-74). Thus, under stress, the bolts 41 break and the lower split flange portion 35 separates from the upper flange member 30 which is welded to the pipe and falls away.

Therefore, Kubasta fails to disclose a first ring and second ring interconnected by a plurality of ligaments with the load magnification member provided on a first ring for a rotatable load. Additionally, in Kubasta, when a predetermined value causes the first and second rings to move relative to one another, the alleged second ring (lower flange) falls away

from the alleged first ring (upper flange). Accordingly, such movement does not bring at least one ligament (bolt) into contact with the load magnification member, as recited in the amended claim. Thus, Kubasta fails to disclose each and every feature recited in the rejected claims.

Okada discloses a torque limiting mechanism that transmits rotational power from an external power source to a driven apparatus (col. 1, lines 4-6). The mechanism is used with an on-vehicle accessory, such as a clutchless-type compressor, that has no clutch between its rotary shaft and a pulley that couples the compressor to the power source (col. 2, lines 55-61). First and second breakable metal wires 13, 14 extend radially and are located on opposite sides of a rotary shaft 7. The wires 13, 14 are designed to be broken when an excessive load is applied to the compressor. The first and second wires 13, 14 couple the bushing 11 with the connector ring 9a at opposite locations with respect to the shaft. The Office Action alleges that the connector ring 9a and the bushing 11 correspond to the first ring and the second ring of the claimed frangible coupling, respectively.

However, Okada does not disclose a small clearance maintained between the members 9a, 11 and the first and second wires 13, 14 (ligaments). As clearly shown in the figures of Okada, there is no such space, and the specification is silent regarding a description of such a space.

Regarding claim 2, Okada fails to disclose that the ligaments (wires) are substantially axially aligned. Rather, as clearly shown in the figures, the wires are radially aligned. Thus, Okada fails to disclose each and every feature recited in the rejected claims.

EP 441 relates to a frangible coupling ring for a fan rotor of a gas turbine engine. A fan de-coupler system 34 is provided in the fan for automatically de-coupling the fan 12 from its bearing support 30 during abnormal rotor imbalance (paragraph [0020]). In an embodiment, a fuse ring 38 is disposed between a forward flange 40 and an aft flange 42 (see

Fig. 5). The fuse ring has a plurality of fuse holes 44 provided at a center of the fuse ring between forward and aft sections of the fuse ring 38a and 38b. The fuse holes 44 create a plurality of ligaments 46 between the holes 44.

However, EP 441 fails to disclose a small clearance maintained between the first and second rings and the ligaments such that in use, when a predetermined load causes the first and second rings to move relative to one another by a predetermined amount, thereby bringing at least one ligament into contact with the load magnification member, at least one ligament is caused to fail. Rather, the forward and aft sections of the fuse ring 38a and 38b are arranged so that movement of the first and second rings relative to one another does not bring at least one ligament 46 into contact with a load magnification member causing the at least one ligament to fail. The arrangement of EP 441 only allows the ligament 46 to connect the forward and aft portions of the fuse ring 38. Accordingly, EP 441 fails to disclose each and every feature recited in the rejected claims.

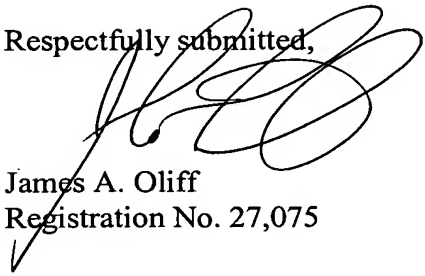
As none of the applied references disclose each and every feature recited in the claims, withdrawal of the rejection of claims 1-15 under 35 U.S.C. §102(b) is respectfully requested.

VII. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-11, 13 and 15 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Amended Abstract
Replacement Sheets

Date: November 23, 2004

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